expression vectors. Such a modified sequence is desired by those of skill in the art to improve expression and immunization protocols for CEA.

SUMMARY OF THE INVENTION

The present invention provides an immunogenic target for administration to a patient to prevent and / or treat cancer. In particular, the immunogenic target is a CEA tumor antigen ("TA") and / or an angiogenesis- associated antigen ("AA"). In one embodiment, the immungenic target is encoded by a modified CEA nucleotide sequence (CEA(6D)-1,2) that improves CEA expression in transfected cells. In certain embodiments, the TA and / or AA are administered to a patient as a nucleic acid contained within a plasmid or other delivery vector, such as a recombinant virus. The TA and / or AA may also be administered in combination with an immune stimulator, such as a co-stimulatory molecule or adjuvant.

BRIEF DESCRIPTION OF TIIE DRAWINGS

Figure 1. A. Illustration of plasmid p3'H6MCEA comprising the CEA coding sequence with the 6D modification under the control of partial H6 promoter. **B.** Illustration of plasmid pSE1544.9 (pUC18-mCEArepeatl).

Figure 2. Illustration of plasmid pSE1616.44 (pUC18-mCEA-modified repeat 1).

Figure 3. Illustration of plasmid pSE1658.15 (p3'H6MCEA-modifed repeat 1).

Figure 4. Illustration of plasmid pBSmCEA.

Figure 5. Illustration of plasmid pSE1686.1 (pUC18 mCEA modified repeat 2.

Figure 6. Illustration of plasmid pSE1696.1 (pUC18 mCEA modified repeat 2.

Figure 7. Illustration of plasmid p3'H6modMCEA-lst&2nd repeats.

Figure 8. Illustration of plasmid pNVQH6MCEA(6D1 st&2nd).

Figure 9A-D. Comparison of nucleotide sequence of CAP(6D) and CAP(6D)-1,2. Differences between the sequences are underlined.

Figure 10. PCR analysis to confirm the presence of CAP(6D)-1,2 in NYVAC DNA.

Figure 11. Immunoblot illustrating the lack of truncated CEA in cells expressing CAP(6D) 1,2.

Figure 12. Human B7.1 gene in an ALVAC C6 donor plasmid under the control of the H6 promoter (SEQ ID NOS.: 11, 12).

Figure 13. CAP(6D)-1,2 CEA DNA sequence in an ALVAC C3 donor plasmid under the control of the H6 promoter (SEQ ID NOS.: 13, 14).